

We claim:

1. A process for preparing xylylenediamine, comprising the steps of ammoxidizing xylene to phthalonitrile and hydrogenating the phthalonitrile, which comprises
  - 5 contacting the vaporous product of the ammoxidation stage directly with a liquid organic solvent or with molten phthalonitrile (quench), partly or fully removing components having a boiling point lower than phthalonitrile (low boilers) from the resulting quench solution or suspension or phthalonitrile melt and,
  - 10 of the phthalonitrile, not removing any products before the hydrogenation, having a boiling point higher than phthalonitrile (high boilers).
2. The process according to claim 1 for preparing meta-xylylenediamine, comprising the steps of ammoxidizing meta-xylene to isophthalonitrile and hydrogenating the isophthalonitrile.
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3. The process according to either of claims 1 and 2, wherein the liquid organic solvent used for the quench is an aromatic hydrocarbon, a heterocyclic compound, an aromatic nitrile and/or a heterocyclic nitrile.
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4. The process according to either of claims 1 and 2, wherein the liquid organic solvent used for the quench is tolunitrile, benzonitrile and/or N-methyl-2-pyrrolidone (NMP).
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5. The process according to any of the preceding claims, wherein, in the quench with a liquid organic solvent, the temperature of the quench effluent is from 40 to 180°C, and, in the quench with molten phthalonitrile, the temperature of the quench effluent is from 165 to 220°C.
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6. The process according to any of the preceding claims, wherein the low boilers are partly or fully removed from the resulting quench solution or suspension or phthalonitrile melt by distillation via the top, while phthalonitrile is removed via the bottom together with products having a boiling point higher than phthalonitrile (high boilers).
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7. The process according to any of claims 1 to 5, wherein the quench of the vaporous product of the ammoxidation stage is carried out in a column in such a way that reaction gases and low boilers are partly or fully removed via the top and phthalonitrile together with products having a boiling point higher than phthalonitrile (high boilers) are removed via the bottom.
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8. The process according to any of the preceding claims, wherein the ammonoxidation is carried out at temperatures of from 300 to 500°C over a catalyst comprising V, Sb and/or Cr, as an unsupported catalyst or on an inert support.
- 5 9. The process according to any of the preceding claims, wherein the hydrogenation is carried out in the presence of ammonia.
10. The process according to any of the preceding claims, wherein the hydrogenation is carried out in the presence or absence of an organic solvent.
- 10 11. The process according to any of the preceding claims, wherein the hydrogenation is carried out at temperatures of from 40 to 150°C over a catalyst comprising Ni, Co and/or Fe, as an unsupported catalyst or on an inert support.
- 15 12. The process according to any of the preceding claims, wherein, after the hydrogenation, the xylylenediamine is purified by distilling off any solvent used and ammonia, and also any relatively low-boiling by-products, via the top and distillatively removing relatively high-boiling impurities via the bottom.
- 20 13. The process according to any of the preceding claims, wherein, after the hydrogenation, any solvent used and ammonia, and also any relatively low-boiling by-products, are distilled off via the top and, afterwards, any relatively high-boiling impurities are removed from the xylylenediamine by distillation via the bottom.
- 25 14. The process according to either of the two preceding claims, wherein the xylylenediamine, after the distillation, is extracted for further purification with an organic solvent.
- 30 15. The process according to the preceding claim, wherein cyclohexane or methylcyclohexane are used for the extraction.